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December 11, 1997

Sherry Halorin
Columbia Falls Aluminum Company
2000 Aluminum Drive
Columbia Falls, MT 59912

Re: On site visit by South Hills Environmental and Flathead County.

Dear Sherry:

I want to thank you, Steve and Mike for your time and cooperation in showing us your system the other day. Your efforts are very much appreciated.

I am enclosing a copy of the report we have prepared. I think most of the recommendations in the report were discussed while on site. In addition to the recommendations of the report I think it might be worthwhile to consider adding the components necessary for [redacted]. With the bacteriological growths experienced in the well and storage tanks, it would be effective preventive maintenance to carry a chlorine residual.

If you have any questions please do not hesitate to call me at 443-4173 or Dick Montgomery at the City-County Health Department.

Sincerely yours,

Dan L. Fraser, P.E.

C. Rick Cottingham & Terry Campbell, Montana DEQ
Dick Montgomery, Flathead City-County Health Department

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Report on Health Advisory Follow-up

by Dick Montgomery, P.E., Dan L. Fraser, P.E. & Denver Fraser, E.I.

System:	Columbia Falls Aluminum Co.	**PWSID:**	00906
Address:	2000 Aluminum Drive Columbia Falls, MT 59912		
Phone:	892-82121 or 892-3261 for general inquires		
Fax:	892-5317		
Contact Persons:	1. Sherry Halorin - 892-8288 2. Steve Wright, P.E., Environmental Manager - 892-8211 3. Mike Davis, Casting Engineer - 892-8262; cellular 250-3895		

Summary of File:

The Columbia Falls Aluminum Company (CFAC) water system has had a few unsatisfactory samples recently. On October 9 TNTC w/o; on October 13 10-, HG (satisfactory), and on November 11 TNTC w/coli. There may be other unsatisfactory samples but they are not in the DEQ file.

After inspecting the system CFAC found a slime in the tanks and had it evaluated for iron bacteria. The evaluation was negative but they have decided to drain, clean and disinfect the storage facilities.

The file showed that in April of 1990 a pump was pulled from well number 7 and found to be covered with a slime growth. The slime was shown to contain *Aeromonas hydrophilia*. This is described in the file as a pathogen found in nature associated with gastroenteritis and pneumonia. Its significance in terms of causing water borne disease was not described and it may not have any. Is apparently easily confused with *E. coli* because of its ability to ferment lactose to form gas.

System Description:

The system is served by 4 high capacity wells. Storage is provided by two 200,000 gallon ground level welded steel storage tank. There are two booster pumping stations within the distribution system for fire protection.

On Site Visit:

Date: Thursday December 4, 1991 - By Dick Montgomery, Denver Fraser & Dan Fraser

Person(s) Seen: Sherry Halorin, Steve Wright & Mike Davis

Findings:

Storage:

Columbia Falls Aluminum Company has received tank disinfection specifications from Terry Campbell of the MT Department of Environmental Quality. They are draining one tank and plan to clean, disinfect and return it to service. They then will repeat the procedure with the other tank.

The tanks are ground level welded steel tanks and appear to be in good condition. The vents are not screened and are not of the inverted U-type, "Ten States Standards" variety. If properly screened they are probably adequate although more subject to wind-blown contaminants that the inverted U-type. The interior surfaces of the tanks, walls and ladders, are covered with a slimy, mud-like grey material. CFAC has had it tested for iron bacteria and the test was negative. We collected a sample while on site and delivered it to the Montana State Public Health Laboratory. After being held over the weekend the sample material was obviously anaerobic by Monday.

Wells:

The system is served by 4 high capacity wells. Two are located near the Flathead River and two are closer to the base of Tea Kettle Mountain. Wells number 4 & 5 each have their own pump houses while numbers 6 & 7 are side by side in a larger pump house. Each of the three pump houses has a pit below the main floor. The pump motors and controls are located on the main floors but the well casings terminate below grade in the pits. The casings of wells 4, 5, & 7 are not sealed at the top. Each is open around the drop (eductor) pipe all the way to the water surface.

Well Number	4	5	6	7
Date Constructed	1954	1954	1956	1957
Pump Type	All vertical turbine pumps. A 1984 DHES inspection report shows the pumps to be powered by 150 HP motors. Capacity is unknown but the old well logs indicate they were pump tested from 900 - 1,500 gpm and well number 7 is has an estimated capacity of 5,000 gpm.			
Casing Diameter	16"	16"	18"	18"
Depth	175	162	70	62
Lubricant	All pump column are lubricated with food grade vegetable oil.			
Venting	Inadequate	Inadequate	none	Inadequate
Grouted	UNK	UNK	UNK	UNK

Pad/Drainage	The casings all terminate below grade. Flooding potential appears low for numbers 4 & 5 but 6 & 7 are in the flood plain. To meet standards the casings should be extended the proper distance above grade and above the 100 year flood elevation. Minimally the casings need to have water tight, vented sanitary seals fabricated. The vents need to terminate the proper distance above grade/flood elevation.			
Treatment	none	none	none	none
Condition	The wells look to be in good condition mechanically. House keeping, however, is poor. The well houses are poorly lighted and dirty. The pits are particulary unsanitary and are open to the producing wells.			
Screened?	All wells are screened with 16 inch Johnson well screens.			
Potential sources of Contamination	Wells number 6 & 7 are close to the river but a long record of satisfactory bacteriological samples indicates they receive natural filtration and are unlikely to be under the direct influence of surface water. The sanitary deficiencies noted above are more significant risks.			
Auxiliary Power	no	no	no	no

Recommendations to PWS:

1. Seal the casings of wells number 4, 5, & 7. We suggest you do this by fabricating a sanitary well seal from metal plates with gasket material sandwiched between them. (See Fig. 3) The upper plates should be of an outside diameter slightly greater than the o.d. of the well casing and have unthreaded holes for bolts, and threaded holes for vents and plugs. The lower plates would then be slightly smaller than the i.d. of the well casing so they can fit inside the casing. The lower plates need threaded holes for the bolts and unthreaded holes for the vents and plugs. Both upper and lower plates would have to have an opening to accommodate the drop pipe and would have to be split for installation. The gasket material would be the same size as the lower plate and made of material that can expand to tightly seal all openings when the two plates are bolted together tightly.

   An inverted U-type vent should be built for each sanitary seal. The vent must be screened and must extend to at least 18 inches above the upper floor in each pump house. As noted above, each sanitary seal should have a threaded plug which can be removed for introduction of chlorine solution or for measuring water levels.
2. A vent must be fabricated for well number 6 too. We suggest that you consider replacing the existing welded seal with one similar to the fabricated sanitary seals described in number 1 above.
3. The power shaft's seal should be tightened or replaced so that water cannot leak out (or in).
4. We suggest that you consider switching to water lubricated line shafts in all wells. The addition of organic vegetable oils may be providing a food source and, thus, contributing to

bacterial growth within the system.

5. The vents on the tanks should be screened tightly to prevent the entry of insects and/or wind-blown materials.
6. A flap gate should be placed on the end of the tanks' overflow pipe.
7. The general house keeping of the well houses should be improved. We suggest that all well houses, and pits, be thoroughly cleaned and painted. Addition of better lighting facilities would be very helpful as well. Facilities for production of drinking water should be kept spotless and should be well lighted to accommodate the operator's daily inspection.
8. All facilities should be inspected on a regular basis. We suggest that you schedule a semi-annual complete inspection to make sure the tanks and wells stay in good condition.
9. Ground fault protection should be provided for all 115 Volt circuits in the well houses and pump stations.

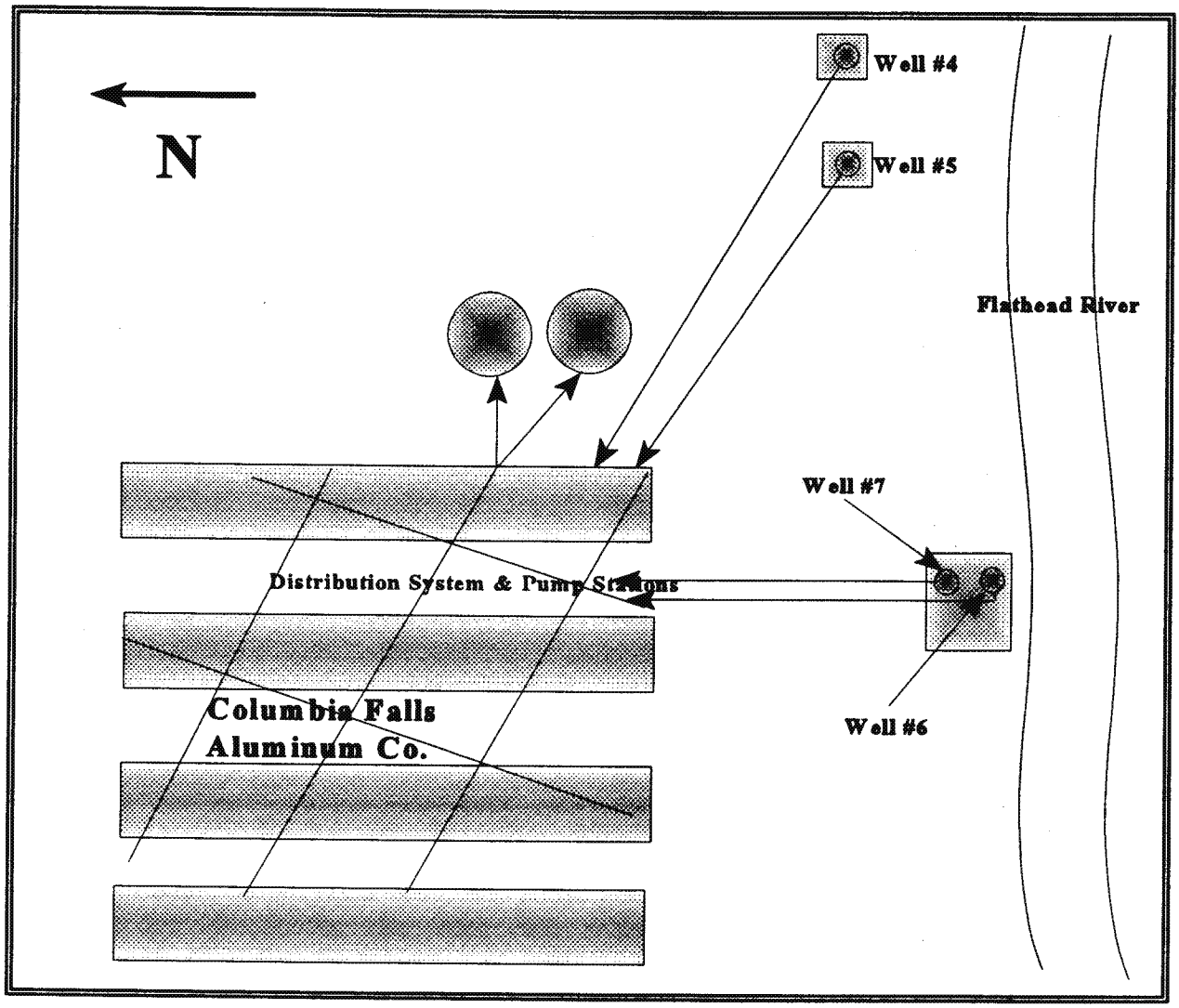

Figure 1. Columbia Falls Aluminum Co.--No Scale

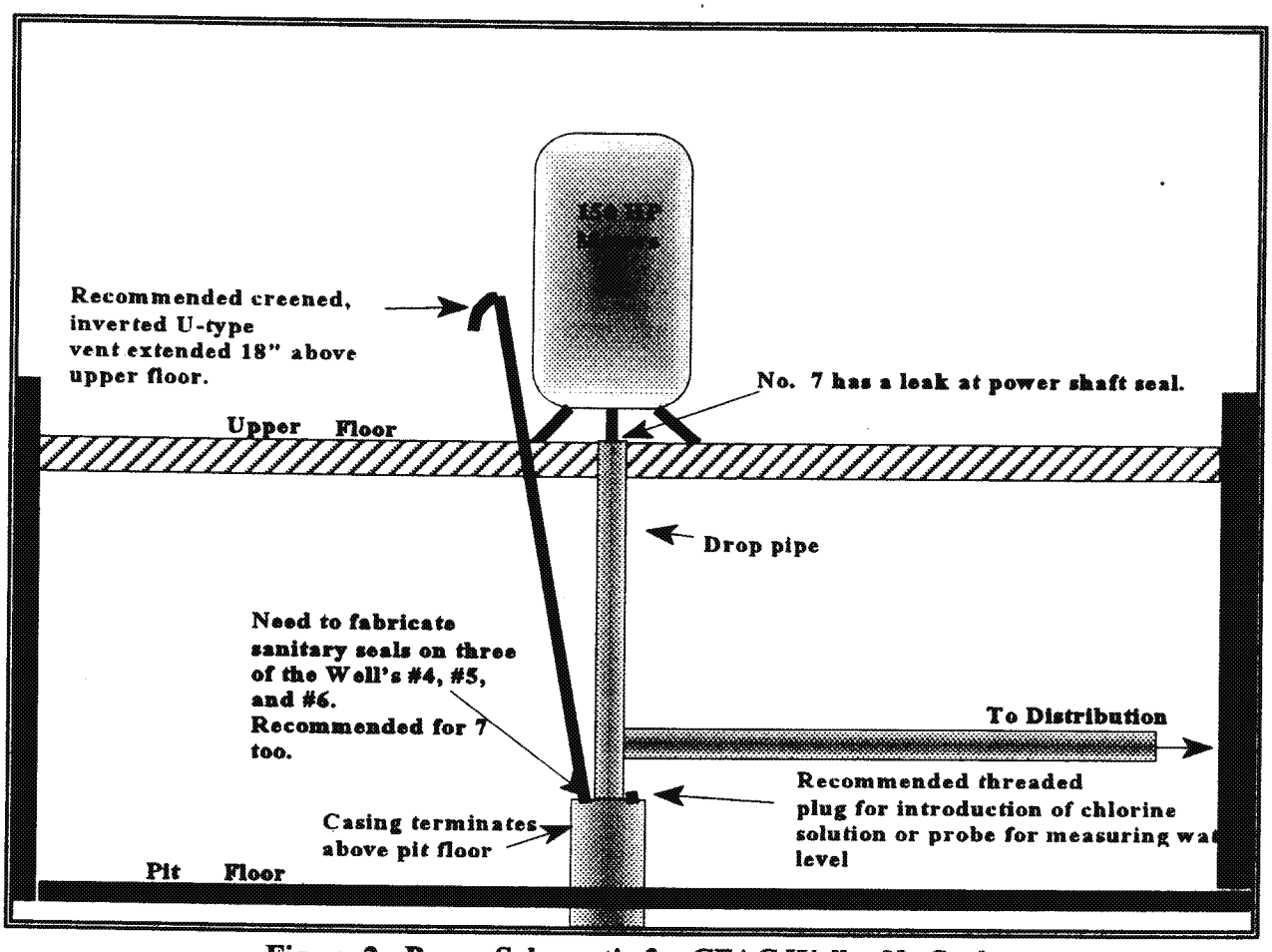

Figure 2. Pump Schematic for CFAC Wells--No Scale

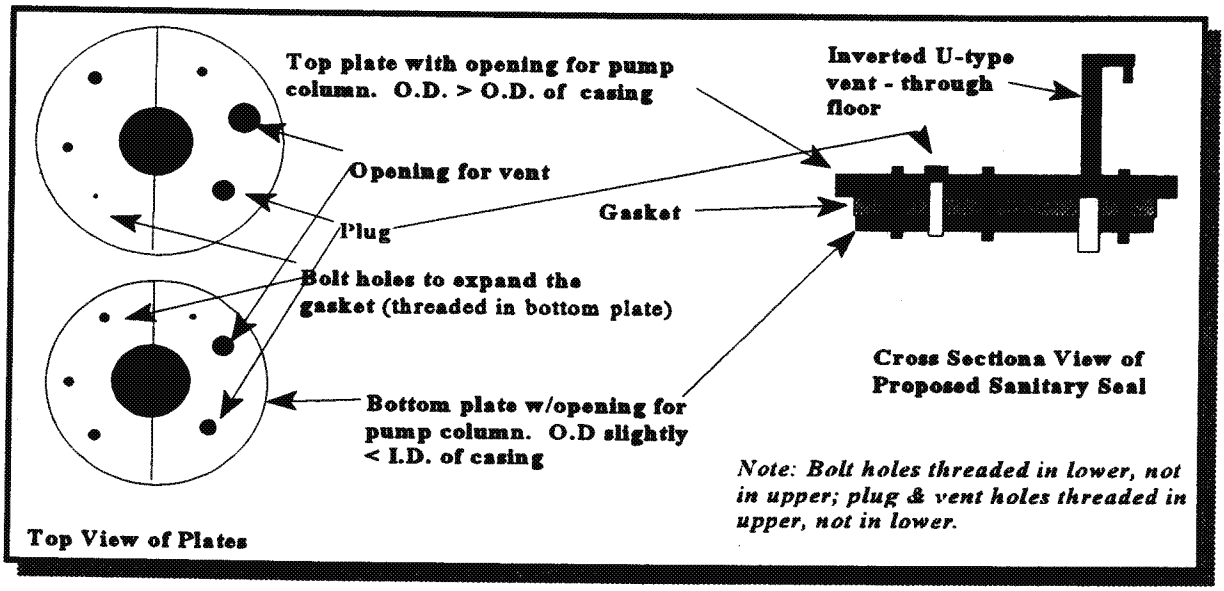

Figure 3. Sanitary well seal